



EICOR  
MODEL 230

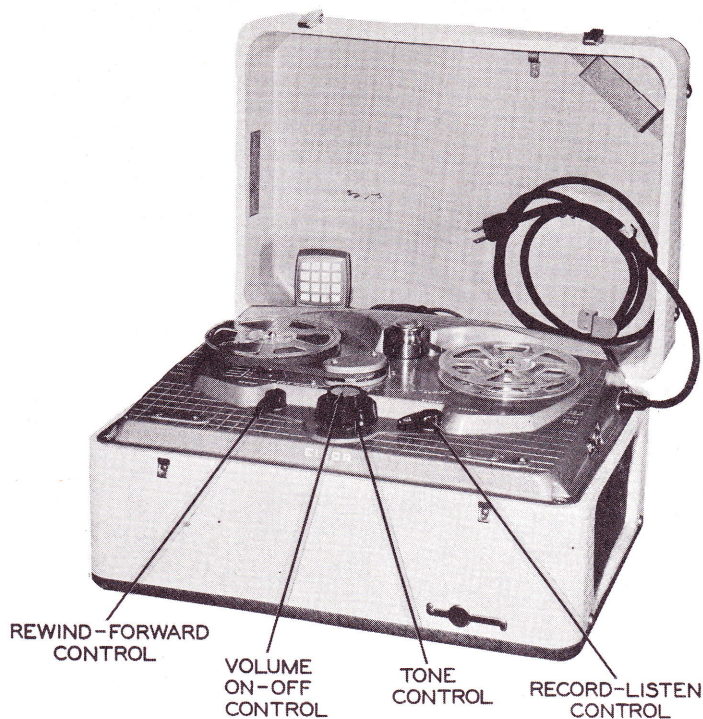


Figure 1

#### GENERAL INFORMATION

The Eicor Model 230 is designed to record and play back two tracks of material on standard width recording tape, which doubles the playing time with no loss of frequency response or quality. Recordings can be made from a radio, television receiver or phonograph, in addition to those made directly from the microphone. Recordings can be played back through the self-contained speaker, external speaker or through a high fidelity amplifier system.

This Eicor is equipped with a dual speed capstan. When the capstan sleeve is in position over the capstan, the tape speed is 7.5 inches per second and with the sleeve removed, a tape speed of 3.75 inches per second will be obtained.

Using both channels of the tape, the recording time is as follows:

SIZE	SPEED	SPEED
	3 3/4	7 1/2
5" reel	1 hour	1/2 hour
7" reel	2 hours	1 hour

Connect this recorder only to an outlet supplying 117 volts, 60-cycle, AC supply.

Manufactured by:

Eicor, Inc.  
1501 West Congress Street  
Chicago, Illinois

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EICOR  
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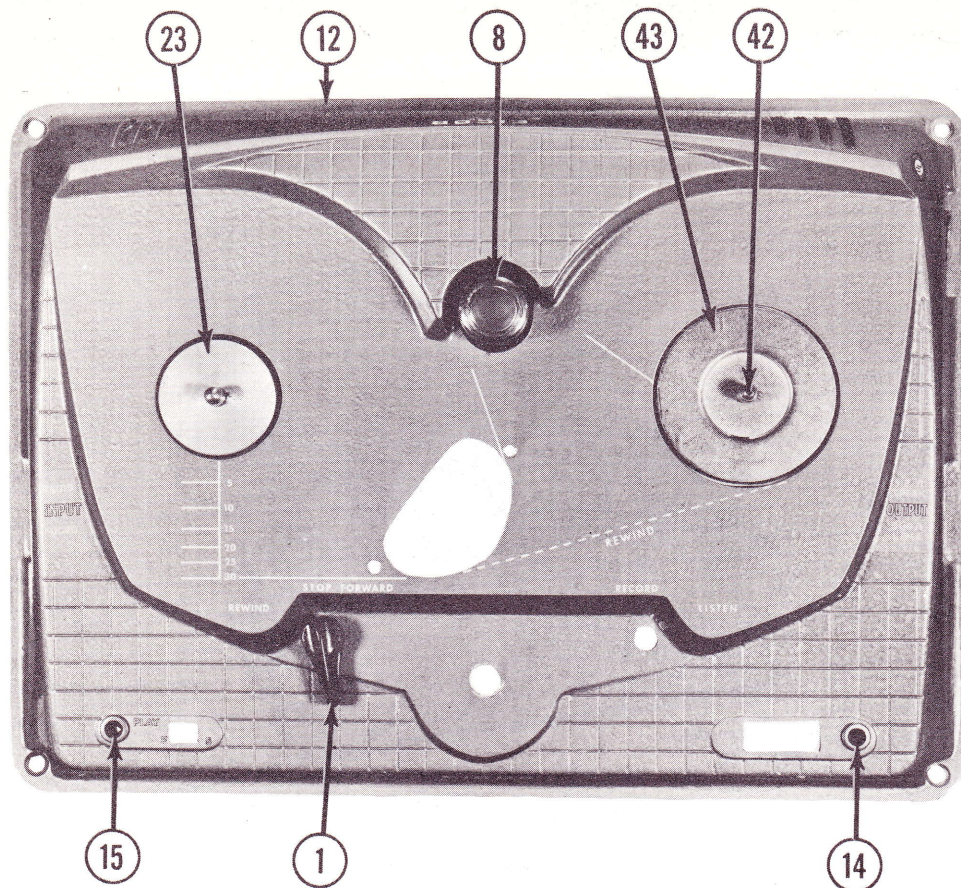


Figure 2

## OPERATING CONTROLS

### To Start-

Turn volume control knob (9) clockwise.

### Volume-

Degree of rotation of volume control knob (9) determines volume of recording and play back.

### Tone-

Tone control knob (10) controls tone and operates only for play back.

### Tape Travel-

Rewing-Stop-Forward control knob (1) controls direction of tape travel. Always return this knob to "Stop" position before turning unit off.

### Record-Listen-

Record-Listed control knob (11) controls amplifier and record playback head. To prevent accidental erasure, place in "Listen" position immediately after recording is completed.

2. Plug the AC cord into a convenient wall receptacle of the proper rating.

### Threading The Tape-

1. Place a reel of tape (either 5" or 7") on the left spindle (23) and an empty reel on the right spindle (43) making sure the reel slots engage the reel pin on the spindles.

2. Thread the tape by following the solid printed line on the top panel (Fig. 1).

**NOTE:** This recorder uses Type "A" wound tape, i.e. the dull magnetic coated side faces inward on the reel. If the tape used is Type "B" (coated side facing outward) the recording will be made at a very low sound level and the playback will be almost inaudible.

3. Insert the free end of the tape through to the hub of the right reel and place a pencil firmly over the tape, forcing it into one of the three radial slots. Turn the reel several turns (counterclockwise) with the pencil in this position until the tape is secured to the reel and all slack is taken up between reels.

## OPERATING INSTRUCTIONS

1. Insert the AC power cord into the receptacle on the right side of the top plate.

### Setting Tape Speed-

The Eicor is equipped with a quick change dual speed capstan. When the capstan sleeve (8) is in



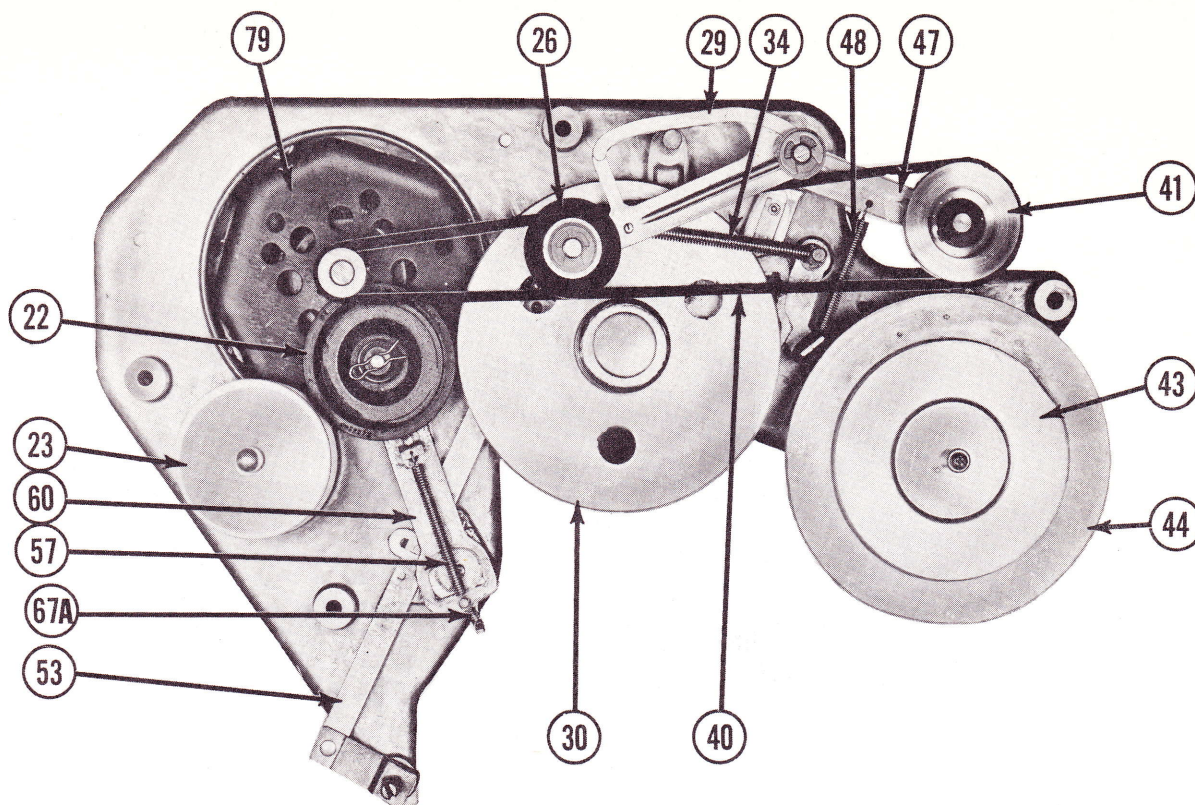


Figure 3

position over the capstan, the tape speed will be 7.5 inches per second and with the sleeve removed, a tape speed of 3.75 inches per second will be obtained.

Because the tone fidelity will vary with the speed of the tape, a compensating circuit activated by the slide switch located next to the green indicator light has been provided. For operation with the capstan sleeve in position, the switch button should be in a full left position and when operating with the sleeve removed, the switch button should be placed in a full right position.

**NOTE:** For recording speech, the slower speed is excellent and allows the maximum recording and playing time. For higher quality recording as is desired for music reproduction, the faster speed is best.

#### To Record From Microphone-

1. Turn the volume control knob (9) to the right until a click is heard and allow about thirty seconds for the amplifier to warm up.
2. Insert microphone plug into input socket labeled "Micro".
3. Turn record-listen knob (11) to "Record" position. When in record position the red light on the right side of the top plate will come on.
4. While talking into the microphone, adjust the volume control until the neon indicator light flashes slightly.

**NOTE:** Correct recording volume is very important. Too weak a signal, which does not cause the neon indicator to flash, will result in weak playback and high background noise. Too strong a signal, causing the indicator to flash constantly, will result in distortion during playback.

#### To Record From Radio-

Recordings can be made from a radio by placing the microphone near the loudspeaker of the radio; however, this type of recording may not be satisfactory as other sounds may be picked up by the microphone which as a result will be recorded on the tape. A superior quality recording can be made by use of the radio-phonograph attachment cord which is supplied with the recorder. Connect attachment cord as follows:

1. Connect the cord clips across the voice coil terminals on the radio speaker.
2. Insert the attachment cord plug into the socket labeled "Radio".
3. Proceed as described in "To Record From Microphone".

**NOTE:** Remove attachment cord after recording is completed.

#### To Record From Phonograph-

1. Connect the cord clips of the attachment cord to the pickup leads on the phonograph.



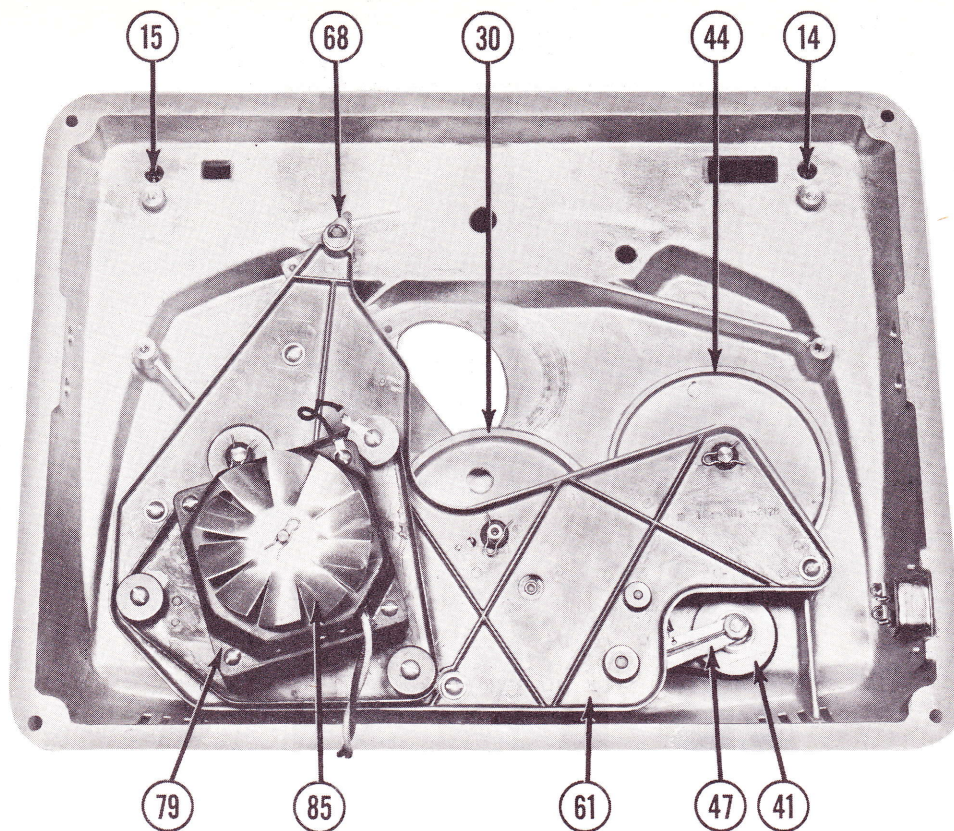


Figure 4

2. Insert the attachment cord plug into the socket labeled "Radio".

3. Proceed as described in "To Record From Microphone".

NOTE: Should a hum develop from the above connection, reverse the cord clips on the pickup leads.

#### To Record From Television Receiver-

1. Connect attachment cord as described in "To Record From Radio" and proceed with recording as described in "To Record From Microphone".

NOTE: The Eicor Tone Control does not operate during recording. When recording from a radio or television receiver, set the radio or television tone control for maximum treble.

#### Dual Track Recording-

The Eicor is designed so that only 1/2 the tape width is recorded at a time; thereby resulting in two track recording. This two track operation is accomplished in the following manner:

1. After a reel of tape has been recorded; i.e. all the tape wound on the right reel, place the rewind-stop-forward control knob (1) in the

"Stop" position. This stops all movement of the tape.

2. Remove the reels from the recorder, turning the full reel over and placing it on the left spindle.

3. Properly thread the tape and proceed with the recording.

4. After the second track has been recorded the first track of recording is ready to be played, without rewinding, by reversing the reels as described in step No. 2 above.

#### To Rewind-

1. With the volume control knob (9) turned on, turn the record-listen control knob (11) to "Listen".

2. Turn the rewind-forward control knob (1) to "Rewind" position. As the tape is rewinding, you will hear your recording played backwards at a high rate of speed. When this sound stops, you have come to the start of your recording. To rewind a full reel of tape, remove the tape from between the pressure roller (26) and capstan so the tape will rewind directly across the recorder to the left-hand reel; it will just touch the bottom of the recording head. This method is faster when rewinding an entire reel and reduces recording head wear.



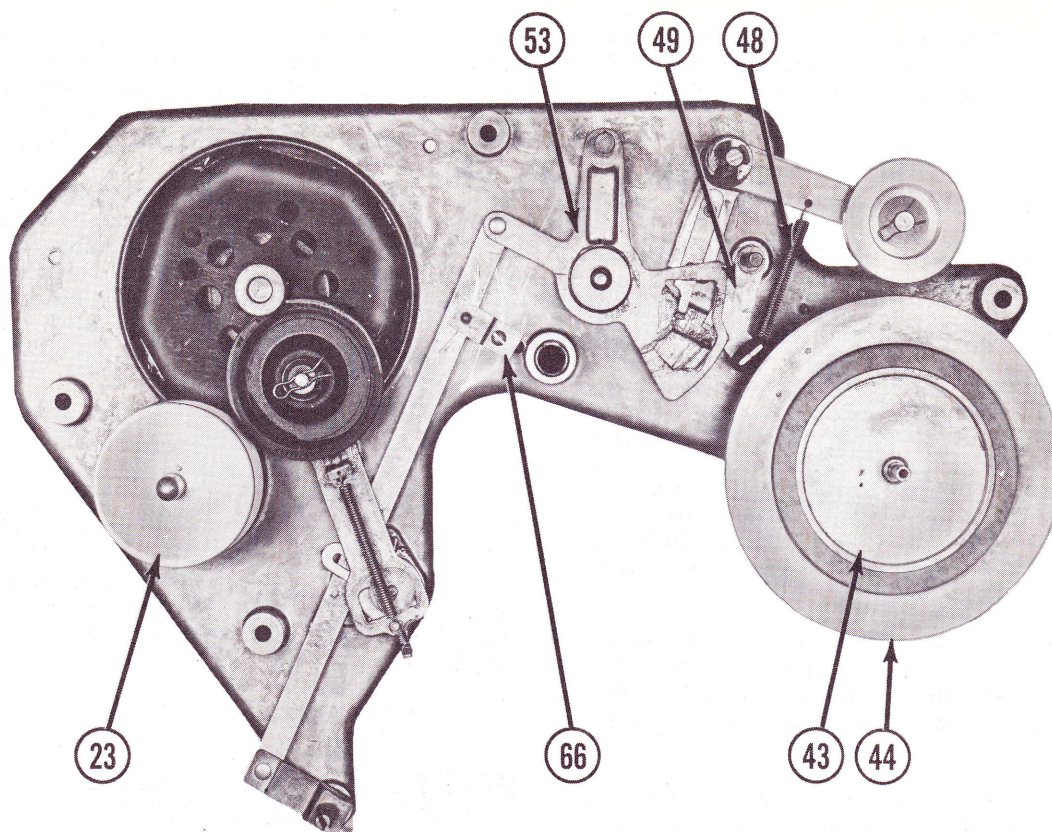


Figure 5

#### To Play a Recording-

1. Thread the tape as described under "Threading the Tape".
2. Turn the On-Off Volume control knob (9) on and allow approximately thirty seconds for the tubes to warm up.
3. Place the record-listen control knob (11) in the "Listen" position.
4. Place the rewind-stop-forward control knob (1) in the "Forward" position and adjust the Volume and Tone control to the desired level.

#### To Use an External Speaker-

Any size speaker of the permanent magnet type, having a  $3.2 \Omega$  voice coil, may be used by connecting the attachment cord across the voice coil terminals of the speaker and then inserting the plug of the attachment cord into the socket labeled " $3.2 \Omega$  Speak".

#### To Edit and Splice Tape-

**NOTE:** Since it is impossible to edit and splice one track without affecting the other, recordings which are to be edited should be limited to one track only.

1. The tape may be edited by cutting out unwanted

portions, or by joining selections into another sequence. Announcements may be inserted between selections, etc. Unused sections of tape can be spliced together for re-use.

2. For best results, cut tape at a slight diagonal, join ends together with splicing tape on the glossy side and trim off any excessive width.

#### Erasing Recorded Material-

It is not necessary to first erase a recorded tape if the same tape is to be used for a new recording. Erasing of recorded material takes place automatically when new material is recorded. If it is desired only to erase a tape, set the machine for recording without having the microphone or attachment cord connected to input jacks.

#### DISASSEMBLY INSTRUCTIONS

To remove the recorder from its cabinet, disconnect the line cord and remove the four No. 10 Phillips head wood screws (13) at the corners of the top panel (12). Insert a thin-blade screwdriver between the panel and the cabinet and pry upwards enough to slip the fingers under the panel. Lift up enough to permit the speaker plug to be disconnected from the amplifier. The recorder can now be removed complete.

In handling the recorder out of its cabinet, care must be taken to avoid damage to the motor fan (85)



and the motor shaft. When replacing the recorder, check to be sure the speaker leads and the motor leads will not be pinched or will not interfere with the recorder mechanism.

#### MECHANICAL DRIVE ASSEMBLY

1. With the rewind-forward control knob (1) in the "Stop" position, idler wheel (22) should be in a neutral position; that is, there should be a clearance of  $1/32$ " between the motor shaft and the idler wheel.

2. With control knob (1) in the "Rewind" position, idler wheel (22) is pivoted against the rewind drum (23) and the motor shaft. This accounts for the fast rewind speed. Make a check, by turning the rewind drum (23) counterclockwise, to see if these parts contact each other properly. The idler wheel should turn the motor shaft. If this does not occur, check for binding parts, oil on the friction surfaces, or looseness of springs (57 and 67A).

3. When control knob (1) is in the "Forward" position, idler (22) is pivoted against the capstan (30), and the "O" ring belt (40), which is driven by the motor belt pulley (16), is pivoted against the rim of the take-up drum (44).

4. With the motor running and the control knob (1) in the "Stop" position there should be at least  $1/32$ " clearance between belt (40) and take-up drum (44).

5. With the motor running and control knob (1) in the "Stop" position, observe belt (40). The same portion of the belt surface should run in the pulley grooves at all times, that is the belt should not rotate about the center of a cross section. If such rotation does occur, belt pulley (16) is not correctly located.

6. Check end play of the rewind drum (23), capstan drum (30) and take-up drum (44). Each should have some end play, not more than  $1/32$ ". Correct assembly of washers on these shafts should control this.

7. With control knob (1) in "Rewind" position, there should be at least  $1/32$ " clearance between the rubber on the brake (49) and the take-up drum (44). With the motor running, move the control knob slowly from "Rewind" to "Stop". Meanwhile, rotate the take-up drum (44) manually. The brake should contact the take-up drum before the rewind drum stops rotating. Bend the brake arm to meet these requirements.

8. Place a full 5" reel of tape on the take-up shaft (43) and run the machine in the "Forward" position. Measure the tension required to hold the tape reel stationary. This tension should be 1 to 2 ounces.

**NOTE:** This tension should be measured after the machine has been running with the clutch slipping for at least one minute. The tension is controlled by the type and amount of lubricant used on the felt washer.

9. Place a full 5" reel of tape on the rewind drum (23) and measure the tension required to pull tape off the reel. The tension should be  $3/8$  to  $3/4$  ounce. The tension is controlled by the type and amount of lubricant used on the felt washer.

10. Check functioning of pressure roller (26) by holding tape disc (43) on take-up drum (44) and letting tape run through capstan. If tape does not run through smoothly, check to see if pressure roller surface is clean and spring tension on arm is adequate. The pressure roller shaft should be well oiled. The pressure roller in contact should be flush up against the capstan.

#### TROUBLES

##### Take-Up Drum and Capstan Speed Irregular-

1. Grease or oil on the rubber surface of idler wheel (22), motor shaft, pressure roller (26), "O" belt (40) and take-up drum (44). Clean these parts with naphtha.

2. Motor belt pulley (16) loose.

##### Tape Overruns When Control Is Turned From "Rewind" to "Stop" Position-

1. Brake assembly (49) not adjusted properly. (See "Mechanical Drive Assembly" #7).

##### Tape Will Not Rewind-

1. Springs (57 and 67A) loose.

##### Tape Will Not Run Forward-

1. Springs (57 and 67A) loose.

#### LUBRICATION

Extreme care must be taken when lubricating the mechanism. For satisfactory operation, the instructions in this section should be followed.

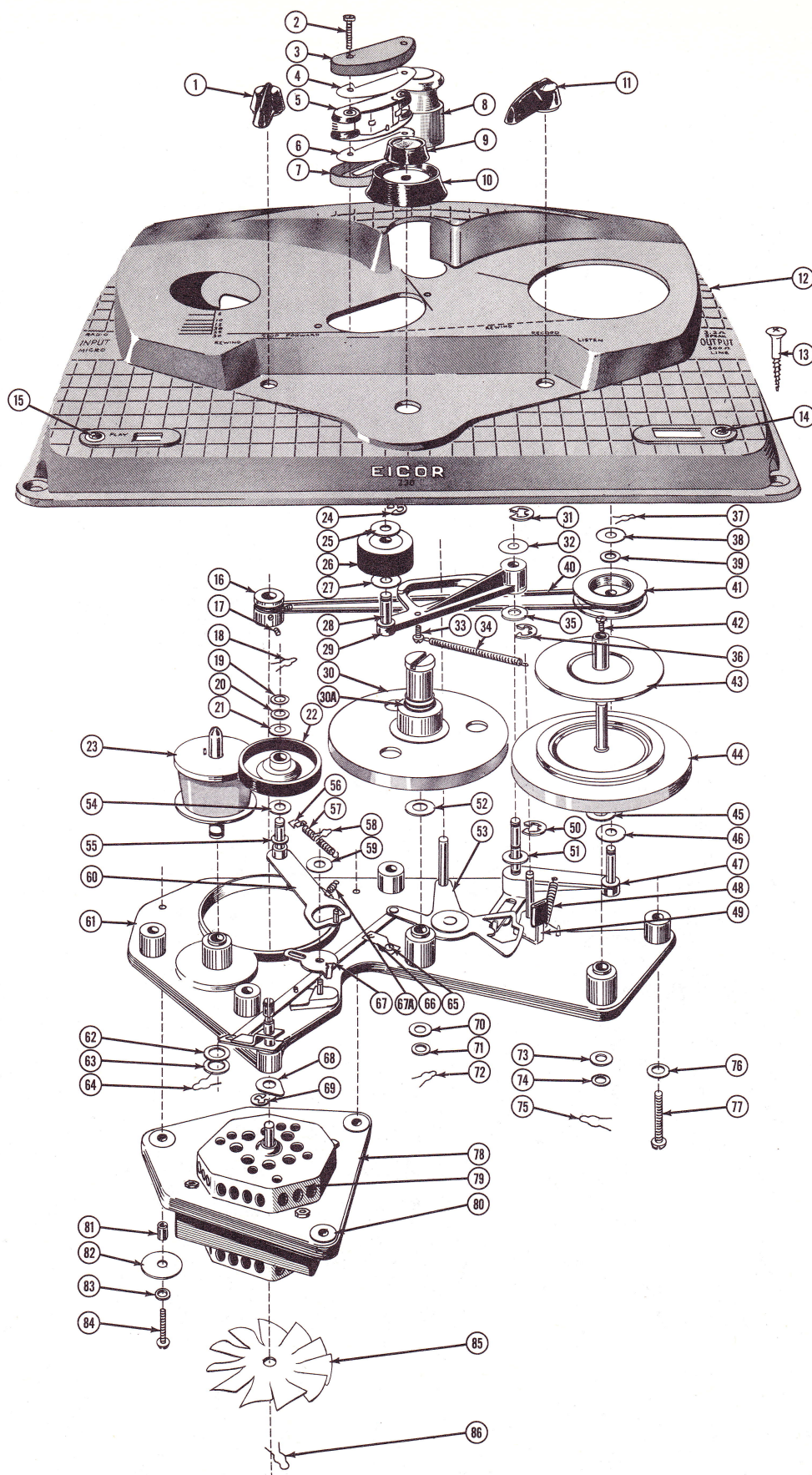
1. Mechanical linkages should be lubricated lightly at points of friction with Sta-Put No. 18-H.

2. The shafts of rotating parts, when replaced, should be wiped clean with a lint-free cloth or paper and oiled lightly with Kensington No. 9 Spindle Oil. Use two or three drops!

3. When lubricating the felt washers on the take-up and rewind drum, use Sta-Put Oil No. 360. Saturate the felt washers and then remove as much of the oil as possible by pressing a cloth or absorbent paper against them.



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A PHOTOFACT "EXPLODED" VIEW  
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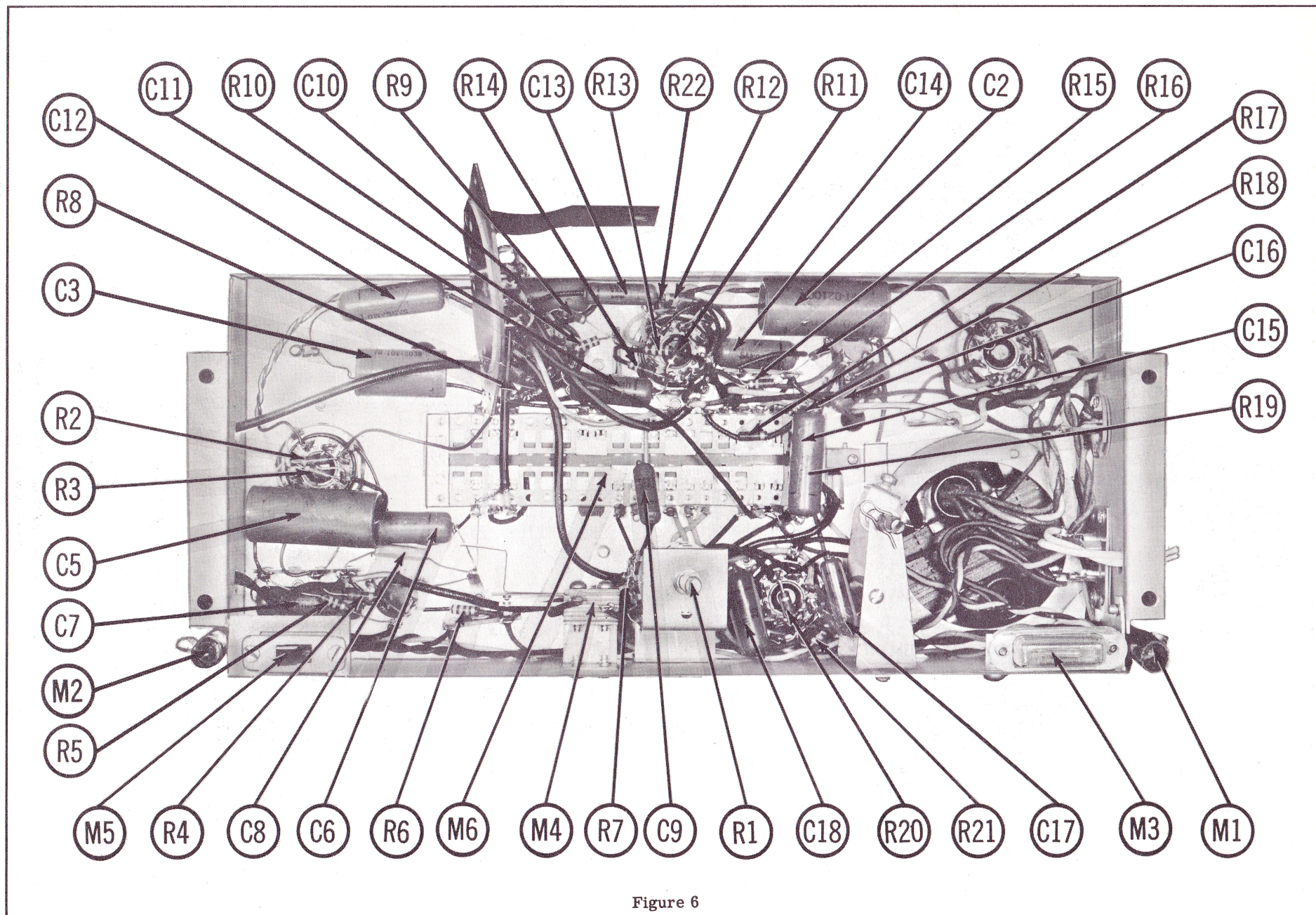
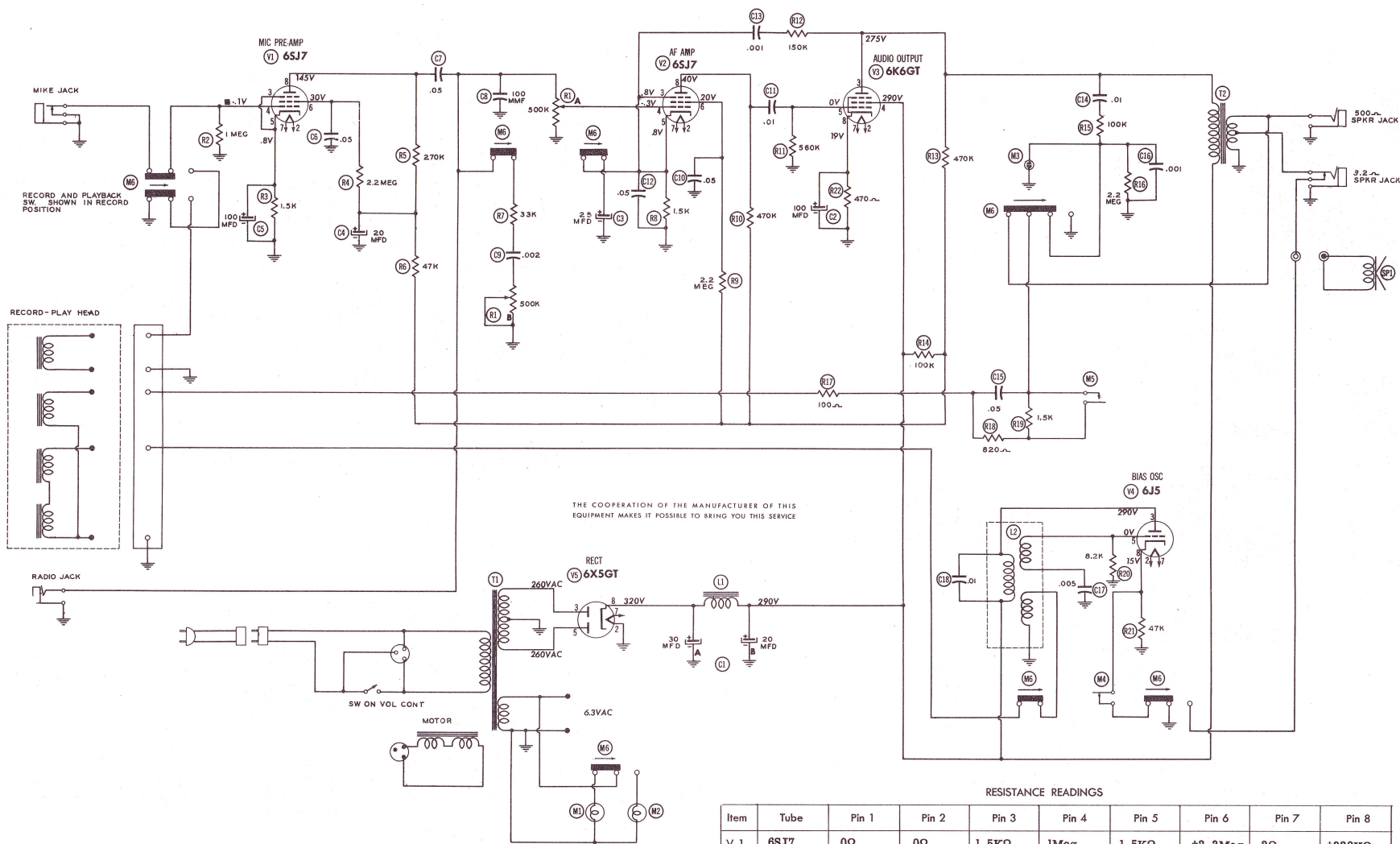


Figure 6





RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SJ7	0Ω	0Ω	1.5KΩ	1Meg	1.5KΩ	†2.3Meg	.2Ω	†320KΩ
V 2	6SJ7	0Ω	0Ω	1.5KΩ	500KΩ	1.5KΩ	†2.3Meg	.2Ω	†570KΩ
V 3	6K6	0Ω	0Ω	†1KΩ	†450Ω	560KΩ	INF	.2Ω	470Ω
V 4	6J5	0Ω	0Ω	†450Ω	†450Ω	8.2KΩ	8.2KΩ	.2Ω	47KΩ
V 5	6X5GT	0Ω	0Ω	220Ω	INF	200Ω	INF	.2Ω	1Meg

ALL READINGS IN PLAY BACK POSITION EXCEPT AS DESIGNATED  
 ■ READINGS TAKEN IN RECORD POSITION  
 † MEASURED FROM PIN 8 OF V5.

A PHOTOFAC STANDARD NOTATION SCHEMATIC  
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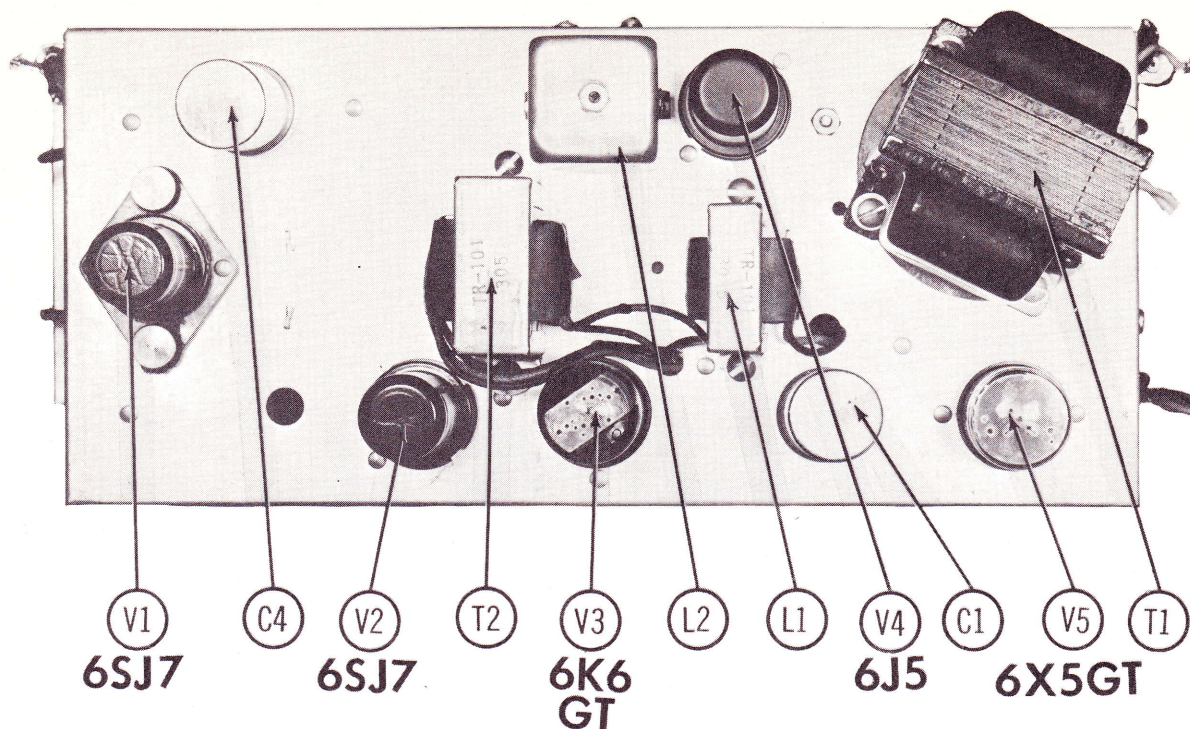


Figure 7

#### MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	TR-101-4119	Rewind-Stop-Forward Control Knob	31	TR-301-2170	"C" Washer
2	TR-101-7031	Phillips Round Head Screw, 6-32	32	TR-301-2184	Bakelite Washer
3	TR-101-1016A	Upper Head Shield	33	TR-301-2180	No. 6 Self Tapping Screw
4	TR-101-1027	.010" Shield	34	TR-101-4092	Pressure Roller Arm Spring
5	TR-301-1062	Head Assembly (cartridge only)	35	TR-301-2184	Bakelite Washer
6	TR-101-1027	.010" Shield	36	TR-301-2170	"C" Washer
7	TR-301-1065A	Lower Head Shield	37	TR-101-2072	Spring Retainer
8	TR-301-2199	Capstan Head & Button Assy.	38	TR-301-2184	Bakelite Washer
9	TR-301-4280	Volume Control Knob	39	TR-101-2012	Felt Washer
10	TR-301-4195A	Tone Control Knob	40	TR-101-2002	"O" Ring Belt
11	TR-101-4119	Record-Listen Control Knob	41	TR-101-2081	Belt Pulley & Bushing Assy.
12	TR-301-4196A	Top Plate	42	TR-101-7005	Binder Head Machine Screw, 4-40 x 3/16
13	TR-101-7010	Phillips Head Wood Screw, 10 x 1 1/4	43	TR-101-2079	Tape Disc Assembly
14	TR-301-4202	Indicator Plug Button (red)	44	TR-301-2194	Take-Up Drum Assembly
15	TR-301-4201	Indicator Plug Button (green)	45	TR-301-2185	Bakelite Washer
16	TR-101-2033	Motor Belt Pulley	46	TR-301-2184	Bakelite Washer
17	TR-101-7004	Allen Set Screw, 6-32	47	TR-101-2080	Belt Pulley Lever & Bushing Assembly
18	TR-101-2073	Spring Retainer	48	TR-101-2101	Brake Drive Spring
19	TR-101-2044	Bakelite Washer	49	TR-101-2094	Brake Assembly
20	TR-101-2030	Felt Washer	50	TR-301-2170	"C" Washer
21	TR-101-2065	Fishpaper Washer	51	TR-101-2012	Felt Washer
22	TR-101-2003	Idler Wheel	52	TR-301-2185	Bakelite Washer
23	TR-301-2195	Rewind Drum Assembly	53	TR-301-2168	Control Link Assembly
24	TR-301-2170	"C" Washer	54	TR-101-2065	Fishpaper Washer
25	TR-301-2184	Bakelite Washer	55	TR-101-2044	Bakelite Washer
26	TR-301-2167A	Pressure Roller Assembly	56	TR-101-2042	Idler Lever Spring Clip
27	TR-301-2184	Bakelite Washer	57	TR-101-2038	Idler Lever Spring
28	TR-301-2179	Pressure Roller Shaft	58	TR-101-2071	Spring Retainer
29	TR-301-2177A	Pressure Roller Arm	59	TR-101-2031	Retaining Washer
30	TR-301-2163	Capstan Drum Assembly	60	TR-101-2089	Idler Lever & Pin Assembly
30A	TR-301-2173	#9 "O" Ring	61	TR-301-2182	Base & Bushing Assembly



# MECHANICAL PARTS LIST (Con't).

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
62	TR-101-2070	Felt Washer	77	TR-301-4214	Round Head Machine Screw, 10-32 x 5/16
63	TR-301-2185	Bakelite Washer	78	TR-101-2086	Motor Mounting Plate (for Alliance motor)
64	TR-101-2073	Spring Retainer		TR-101-2134	Motor Mounting Plate (for Fasco motor)
65	TR-301-3184	Self Tapping Screw, No. 4	79	TR-101-1000	Motor (Alliance)
66	TR-301-2189	Control Link Stop		TR-101-2136	Motor (Fasco)
67	TR-101-2043	Idle Cam	80	TR-101-2001	Grommet
68	TR-301-2157	Control Switch Arm	81	TR-101-2006	Bushing
69	TR-301-2174	"C" Washer	82	TR-101-2150	Washer
70	TR-101-2070	Felt Washer	83	TR-301-7002	Split Lockwasher, No. 10
71	TR-301-2185	Bakelite Washer	84	TR-101-7003	Round Head Machine Screw
72	TR-101-2073	Spring Retainer	85	TR-101-2095	Fan
73	TR-101-2070	Felt Washer	86	TR-101-2073	Spring Retainer
74	TR-301-2185	Bakelite Washer			
75	TR-101-2073	Spring Retainer			
76	TR-301-4216	Washer, No. 10			

# ELECTRICAL PARTS LIST

Ref. No.	Description	Ref. No.	Description
V1	6SJ7, Mic. Pre-Amp.	R5	Resistor, 270K $\Omega$ , 1/2 Watt
V2	6SJ7, AF Amp.	R6	Resistor, 47K $\Omega$ , 1/2 Watt
V3	6K6GT, Power Output	R7	Resistor, 33K $\Omega$ , 1/2 Watt
V4	6J5, Bias Oscillator	R8	Resistor, 1500 $\Omega$ , 1/2 Watt
V5	6X5GT, Rectifier	R9	Resistor, 2.2 Meg., 1/2 Watt
C1A	Electrolytic Cap., 30mfd. @ 350V.	R10	Resistor, 470K $\Omega$ , 1/2 Watt
C1B	Electrolytic Cap., 20mfd. @ 350V.	R11	Resistor, 560K $\Omega$ , 1/2 Watt
C2	Electrolytic Cap., 100mfd. @ 25V.	R12	Resistor, 150K $\Omega$ , 1/2 Watt
C3	Electrolytic Cap., 25mfd. @ 25V.	R13	Resistor, 470K $\Omega$ , 1/2 Watt
C4	Electrolytic Cap., 20mfd. @ 350V.	R14	Resistor, 100K $\Omega$ , 1/2 Watt
C5	Electrolytic Cap., 100mfd. @ 25V.	R15	Resistor, 100K $\Omega$ , 1/2 Watt
C6	Capacitor, .05mfd. @ 400V.	R16	Resistor, 2.2 Meg., 1/2 Watt
C7	Capacitor, .05mfd. @ 400V.	R17	Resistor, 100 $\Omega$ , 1/2 Watt
C8	Capacitor, 100mmf., Mica	R18	Resistor, 820 $\Omega$ , 1 Watt
C9	Capacitor, .002mfd. @ 200V.	R19	Resistor, 1500 $\Omega$ , 1 Watt
C10	Capacitor, .05mfd. @ 400V.	R20	Resistor, 8200 $\Omega$ , 1/2 Watt
C11	Capacitor, .01mfd. @ 600V.	R21	Resistor, 47K $\Omega$ , 1/2 Watt
C12	Capacitor, .05mfd. @ 400V.	R22	Resistor, 470 $\Omega$ , 1 Watt
C13	Capacitor, .001mfd. @ 600V.	T1	Power Transformer
C14	Capacitor, .01mfd. @ 600V.	T2	Output Transformer
C15	Capacitor, .05mfd. @ 400V.	L1	Filter Choke
C16	Capacitor, .001mfd. @ 600V.	L2	Bias Osc. Coil
C17	Capacitor, .005mfd. @ 600V.	SP1	5" x 7" Oval Speaker, PM (3.2 $\Omega$ )
C18	Capacitor, .01mfd. @ 600V.	M1	Pilot Light, Type #47 (Record Indicator)
R1A	Volume Control & Switch, 500K $\Omega$ (Rear Section)	M2	Pilot Light, Type #47 (Play Indicator)
R1B	Tone Control, 500K $\Omega$	M3	Neon Lamp (Record Level Indicator)
R2	Resistor, 1 Meg., 1/2 Watt	M4	Switch, Erase Interlock
R3	Resistor, 1500 $\Omega$ , 1/2 Watt	M5	Speed Equalization Switch
R4	Resistor, 2.2 Meg., 1/2 Watt	M6	Play-Record Switch

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